ORIGINAL RESEARCH

Change in Angina Symptom Status After Acute Myocardial Infarction and Its Association With Readmission Risk: An Analysis of the Translational Research Investigating Underlying Disparities in Acute Myocardial Infarction Patients' Health Status (TRIUMPH) Registry

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***Background*—**Angina is common both before and after myocardial infarction (MI). Whether the change in angina status within the first 30 days after MI is associated with subsequent readmission and angina persistence is unknown.

***Methods and Results*—**We studied 2915 MI patients enrolled at 24 hospitals in the Translational Research Investigating Underlying Disparities in Acute Myocardial Infarction Patients' Health Status (TRIUMPH) registry. Angina before and 30 days after MI was assessed with the Seattle Angina Questionnaire. Patients were divided into angina-free pre- and post-MI (−/−), resolved angina (+/−), new angina (−/+), and persistent angina (+/+) groups. Multivariable proportional hazards and hierarchical modified Poisson models were performed to assess the association of each group with all-cause readmission, readmission for MI or unplanned revascularization, and angina persistence at 1 year. Overall, 1293 patients (44%) had angina before their MI and 849 (29%) reported angina within 30 days of discharge. Patients with post-MI angina were more likely to be younger, nonwhite, and uninsured. Compared with patients who were angina-free pre- and post-MI, 1-year all-cause readmission risks were significantly higher for patients with persistent angina (hazard ratio [HR], 1.35; 95% CI 1.06–1.71) or new angina (HR, 1.40; 95% CI, 1.08–1.82). At 1 year, angina was present in 22% of patients and was more likely if angina was persistent (HR, 3.55; 95% CI, 3.05–4.13) or new (HR, 3.38; 95% CI, 2.59–4.42) at 30 days compared with patients who were angina-free pre- and post-MI.

***Conclusions*—**Post-MI angina, whether new or persistent, is associated with higher likelihood of readmission. Prioritizing post-MI angina management is a potential means of improving 1-year outcomes. **(*J Am Heart Assoc*. 2016;5:e003205 doi: 10.1161/JAHA.116.003205)**

Key Words: angina • coronary disease • myocardial infarction

Angina is common after acute myocardial infarction (MI) and has substantial impact on patient-reported quality of life, treatment satisfaction, and costs of care.[1–4] Approximately 25% of patients report angina symptoms in the year after MI.[5,6] Having angina before an MI is highly predictive of angina after MI. However, many patients have resolution of angina and some develop new angina that was not present before their MI.[7] The importance of change in angina status is unknown, especially with regard to its association with long-term angina symptoms (eg, 1 year post-MI) and readmission.

Avoidance of unnecessary readmission after MI is a focus of the Affordable Care Act, and readmission rates are publicly reported.[8] Though current efforts to prevent readmissions have targeted the initial 30 days after MI, high rates of readmission are observed in the first year post-MI and also warrant efforts to avoid them, particularly as health care moves to accountable care organizations.[9] Thus, the initial clinical assessment after discharge could identify patients at high risk for hospitalization and continued angina symptoms. Previous studies have reported demographic and clinical variables associated with readmission,[10,11] but the impact of pre- and post-MI angina has not been assessed.

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An accompanying Table S1 is available at http://jaha.ahajournals.org/content/5/6/e003205/DC1/embed/inline-supplementary-material-1.pdf

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To address this gap in knowledge, we used the Translational Research Investigating Underlying Disparities in Acute Myocardial Infarction Patients' Health Status (TRIUMPH) prospective registry to examine patients with angina before and/or after MI. Our objectives were to: (1) report patterns of change in angina symptom status immediately before and after MI; (2) describe baseline characteristics of patients according to change in angina symptoms; and (3) examine the association between change in angina symptoms and risk of readmission and angina status at 1 year.

Methods

Study Population

Details of the TRIUMPH registry have been previously described.[12] In brief, TRIUMPH is a prospective multicenter registry of patients with ST-elevation (STEMI) or non-ST-elevation MI (NSTEMI). Eligible patients were ≥18 years old with objective criteria for MI (biomarker evidence of myocardial injury and clinical features of ischemia) treated at one of 24 US hospitals within 24 hours of original presentation. From April 2005 to December 2008, 4340 patients were enrolled. All participants provided written, informed consent. Institutional review board approval was obtained at each participating institution.

In order to study the change in angina symptoms from baseline to 30 days after MI, we excluded all patients without complete angina data at these time points. Of the 4340 patients in the full cohort, 24 died during the index hospitalization (0.6%), 16 lacked baseline angina data (0.4%), and 1385 lacked angina data at 30 days (31.9%). Compared with our study population, subjects missing angina data at 30 days were more likely to be younger, black, and uninsured, with modestly higher rates of angina at baseline (Table S1), and the observed data were weighted to account for patients with missing data, as described in the Statistical Analysis section below. Our final analytic sample included 2915 patients.

Data Collection

Trained research personnel performed detailed baseline interviews within 24 to 72 hours of initial presentation. These interviews included general sociodemographic information, past medical history, and assessments of angina symptoms using the 19-item Seattle Angina Questionnaire (SAQ).[13] Patients' general mental and physical function was assessed with the 12-item short form (SF-12),[14] and depressive symptoms were measured with the 9-item Patient Health Questionnaire (PHQ-9).[15] The SAQ has a 4-week recall period, such that the baseline assessment quantified patients' angina burden over the 4 weeks before their MI. Additional information was obtained by retrospective abstraction of the in-hospital medical record and included presenting clinical features, in-hospital treatment, in-hospital events, discharge medications, discharge recommendations, and final diagnoses. Follow-up assessments were conducted at 1 month, 6 months, and 1 year, either by phone or during an in-home visit. Patients responded to the full SAQ at each time point and reported interval hospitalizations, procedures, medication use, smoking status, and cardiac rehabilitation attendance.

The primary exposure variable was the presence of angina before and 30 days after patients' MIs. To quantify angina, we used the SAQ Angina Frequency score, which has been shown to be a highly valid assessment of angina as compared with daily diaries.[16] For these analyses, angina was dichotomized as any (SAQ Angina Frequency score <100) or no angina (SAQ Angina Frequency score=100).

Outcomes

The primary outcome of this study was the incidence of all-cause readmission within 1 year after MI. Secondary outcomes include (1) readmission for MI or unplanned (nonelective) revascularization at 1 year and (2) angina symptoms at 1 year. Hospitalizations and procedures reported by patients during follow-up triggered collection of medical records, which were

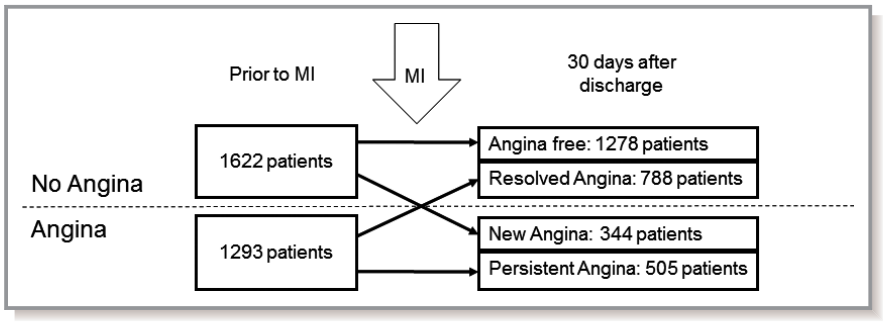

Figure 1. Angina status before and after myocardial infarction. Patients were assessed for angina symptoms before and after admission for myocardial infarction and classified in 4 groups describing the change in angina symptoms.

Table 1. Characteristics of Patients After MI According to Change in Angina Status

Variable	Angina-Free (−/−) N=1278	Resolved (+/−) N=788	Persistent (+/+) N=505	New (−/+) N=344	*P* Value
Demographics (%)					
Age, y	60.9±12.0	60.1±11.7	57.5±11.8	56.7±12.4	<0.001
Male	860 (67.3)	562 (71.3)	291 (57.6)	225 (65.4)	<0.001
White race	966 (75.7)	586 (74.5)	317 (63.1)	229 (66.8)	<0.001
BMI	29.6±6.4	29.7±6.0	29.6±6.3	29.7±6.6	0.861
High school education or greater	1051 (82.5)	644 (82.4)	391 (77.5)	278 (81.1)	0.008
Uninsured/self-pay	184 (14.7)	115 (14.8)	114 (23.2)	75 (22.3)	<0.001
Insurance coverage for medications	979 (78.3)	590 (76.2)	347 (69.8)	231 (68.1)	<0.001
Clinical history (%)					
Past MI	223 (17.5)	172 (21.8)	132 (26.1)	58 (16.9)	<0.001
Past PCI	210 (16.4)	168 (21.3)	130 (25.7)	58 (16.9)	<0.001
Past CABG	125 (9.8)	96 (12.2)	88 (17.4)	27 (7.8)	<0.001
Diabetes mellitus	345 (27.0)	229 (29.1)	183 (36.2)	83 (24.1)	0.003
Heart failure	79 (6.2)	43 (5.5)	63 (12.5)	21 (6.1)	<0.001
Past stroke	54 (4.2)	35 (4.4)	35 (6.9)	11 (3.2)	0.064
Chronic lung disease	66 (5.2)	61 (7.7)	57 (11.3)	28 (8.1)	<0.001
Hypertension	808 (63.2)	550 (69.8)	347 (68.7)	212 (61.6)	0.094
Dyslipidemia	602 (47.1)	450 (57.1)	253 (50.1)	156 (45.3)	0.468
Current cigarette smoking	451 (35.6)	263 (33.9)	210 (41.8)	160 (46.9)	<0.001
In-hospital characteristics (%)					
STEMI	615 (48.1)	347 (44.0)	186 (36.8)	170 (49.4)	<0.001
Ejection fraction	49.2±12.5	48.6±12.9	50.5±12.7	48.8±13.1	0.084
Multivessel disease	585 (48.5)	375 (50.3)	219 (48.6)	166 (50.6)	0.804
Angina frequency at baseline (%)					<0.001
Daily	0 (0.0)	33 (4.2)	46 (9.1)	0 (0.0)	
Weekly	0 (0.0)	208 (26.4)	180 (35.6)	0 (0.0)	
Monthly	0 (0.0)	547 (69.4)	279 (55.2)	0 (0.0)	
None	1278 (100.0)	0 (0.0)	0 (0.0)	344 (100.0)	
SF-12 Mental component score	52.0±10.4	49.9±11.1	45.0±12.4	51.3±10.2	<0.001
SF-12 Physical component score	46.7±10.9	40.1±11.9	36.3±12.2	44.4±11.7	<0.001
PHQ-9 Depression score	3.9±4.6	5.5±5.5	8.1±6.1	4.7±4.6	<0.001
Treatment characteristics					
Fibrinolytic therapy	93 (7.3)	41 (5.2)	26 (5.1)	23 (6.7)	0.120
In-hospital PCI	891 (69.7)	547 (69.4)	301 (59.6)	238 (69.2)	<0.001
In-hospital CABG	118 (9.2)	100 (12.7)	39 (7.7)	29 (8.4)	0.304
Residual stenosis ≥70% in at least 1 vessel	613 (48.0)	399 (50.6)	236 (46.7)	186 (54.1)	0.801
Defect-free care*	714 (55.9)	428 (54.3)	200 (58.1)	262 (51.9)	0.289
Medication/cardiac rehabilitation at 1 month (%)					
Aspirin	963 (87.3)	593 (86.3)	384 (83.8)	259 (83.8)	0.038
Beta-blocker	951 (86.2)	613 (89.2)	405 (88.4)	280 (90.6)	0.087
Statin	933 (84.6)	574 (83.6)	372 (81.2)	266 (86.1)	0.226

Continued

Table 1. Continued

Variable	Angina-Free (−/−) N=1278	Resolved (+/−) N=788	Persistent (+/+) N=505	New (−/+) N=344	*P* Value
ACE-I/ARB	784 (71.1)	480 (69.9)	322 (70.3)	217 (70.2)	0.728
Nitrate/ranolazine	52 (4.7)	50 (7.3)	108 (23.6)	34 (11.0)	<0.001
Cardiac rehabilitation participation	377 (30.5)	231 (30.5)	127 (25.8)	111 (33.2)	0.176

ACE-I indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; BMI, body mass index; CABG, coronary artery bypass graft; MI, myocardial infarction; PCI, percutaneous coronary intervention; PHQ-9, the 9-item Patient Health Questionnaire; SF-12, 12-item short form; STEMI, ST-segment elevation myocardial infarction.
*Defined as discharge on all of the following meds in the absence of contraindication: aspirin, beta-blocker, ACE/ARB, statin, thienopyridine.

reviewed independently by 2 cardiologists to classify the primary reason for hospitalization. Disagreement between the 2 cardiologists was adjudicated by a third cardiologist and, if there was continued disagreement, up to 5 cardiologists until consensus was achieved. Admission for unplanned revascularization was defined as an admission for nonelective percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) surgery, given that PCI or CABG performed electively within 1 month of the index MI hospitalization was considered planned (staged) procedures and was excluded. Patient-reported hospitalizations were excluded from the assessment of readmission for MI or unplanned revascularization if medical records could not be obtained for adjudication. Angina symptoms were assessed with the SAQ as previously described and the same dichotomization of the SAQ Angina Frequency score was used to define the presence of angina at 1 year. Mortality was assessed by query of the Death Master File using patients' Social Security number. Outcomes were assessed starting at the 30-day follow-up interview.

Statistical Analysis

Based on patient-reported angina status during the 4 weeks before and after the patient's MI, patients were divided into 4 groups: angina-free pre- and post-MI (−/−); resolved angina (+/−); persistent angina (+/+); and new angina (−/+) post-MI. Baseline differences in categorical variables were assessed with chi-square or Fisher's exact test, as appropriate, and continuous variables were compared with 1-way ANOVA.

To assess the association between angina groups and readmission, we first performed a Kaplan–Meier analysis with log-rank test. Next, multivariable proportional hazards models stratified by hospitals were used for all-cause readmission and readmission for MI or unplanned revascularization. A hierarchical multivariable modified Poisson model with hospital as a random effect was used for associating the groups with the presence of angina 1 year after MI. Angina-free patients were used as the reference group in all analyses. Variables included in the model were selected a priori, based upon clinical judgment and literature review. All of the following variables were used for each of the outcomes models (all-cause readmission, readmission for MI or unplanned revascularization, and angina). We included factors potentially related to angina or hospitalization, including patient demographics (age, race, and sex), socioeconomic factors (education, insurance status), medical history (past heart failure, diabetes mellitus, past lung disease, and current or recent smoking), history of coronary heart disease (past MI, past PCI, past CABG), patient-reported health status (SF mental and physical scores, PHQ-9 depression score), presenting characteristics (STEMI presentation), and inpatient care (in-hospital PCI, residual coronary stenosis [≥70% in at least 1 vessel] and defect-free discharge care [defined as discharge on all of the following meds in the absence of contraindication: aspirin, beta-blocker, angiotensin-converting enzyme/angiotensin receptor blocker {ACE/ARB}, statin, and thienopyridine]).

We then grouped patients by the frequency of their post-MI angina (none, daily, weekly, and monthly) and assessed the association of angina frequency with readmission and 1-year angina using the methods described above.

The 3 data variables with highest missing rates were PHQ score (6.0%), SF physical component summary (4.5%), and SF mental component summary (4.5%). Missing data were imputed from multiple imputation models using IVEware (University of Michigan, Ann Arbor, MI). Inverse probability weighting was used for all multivariable models to correct for selection bias related to patients excluded because of lack of 30-day angina status. We used SAS (version 9.3; SAS Institute Inc., Cary, NC), and R software (version 2.15.3; R Foundation for Statistical Computing, Vienna, Austria) to conduct our analyses. All analyses were prespecified, and a 2-sided *P* value less than 0.05 was considered statistically significant.

Results

Of 2915 patients presenting with acute MI, 1293 (44.4%) reported angina in the 4 weeks before admission. At 30 days

post-MI, 849 patients (29.1%) reported angina. Overall, 1278 patients (43.8%) were angina-free at both time points, 788 (27.1%) had angina before admission that resolved by 30 days, 344 (11.8%) had new angina develop after their MI, and 505 patients (17.3%) had persistent angina at 30 days (Figure 1).

Baseline demographics and clinical characteristics differed between the four groups (Table 1). Patients with post-MI angina (persistent or new angina groups) were more likely to be younger, nonwhite, and uninsured. Patients with persistent angina, compared with patients whose angina resolved, had more-frequent angina at baseline and were more likely to present with NSTEMI. Patients with persistent angina also had worse baseline physical and mental function and higher rates of depressive symptoms. Treatment characteristics were similar among the 4 groups, with the exception of less in-hospital PCI use in the persistent angina group. Rates of residual obstructive coronary disease (≥70% in at least 1 vessel) were similar across all groups. The use of evidence-based, secondary prevention medications at the time of the 30-day follow-up visit was similar among groups, with the exception of significantly higher use of long-acting nitrates and ranolazine among patients with persistent angina. Less than one third of patients attended cardiac rehabilitation in all groups.

Kaplan–Meier curves showing time to first all-cause readmission are shown in Figure 2A. At 1 year, there was no significant difference in readmission rates between patients with resolved angina and those who were angina-free before and after their MI. However, those with angina 30 days after their MI, whether persistent or newly developed, had higher rates of readmission. Risk of readmission for MI or unplanned (nonelective) revascularization was also greater among patients with persistent or new angina (Figure 2B). After multivariable adjustment, risk of all-cause readmission was significantly higher among patients with persistent angina (hazard ratio [HR], 1.35; 95% CI, 1.06–1.71) and new angina (HR, 1.40; 95% CI, 1.08–1.82), as compared with angina-free patients. Only patients with new angina had higher rates of readmission for MI or unplanned revascularization as compared with patients who were angina-free (relative risk [RR], 2.18; 95% CI, 1.28–3.72; Table 2).

We subsequently assessed whether the frequency of post-MI angina (new or persistent) was associated with readmission rates and 1-year angina. Compared with patients without post-MI angina, increased frequency of post-MI angina was associated with readmission in a step-wise fashion after adjustment (Table 3), with greater angina burden associated with higher readmission rates.

Among 1-year survivors, the overall prevalence of angina was 22.0%. Angina at 1 year was most frequent in the patients who had persistent angina at 30 days (49.6%), followed by those with new angina (38.6%) and resolved angina (18.2%). After adjusting for covariate imbalance between the groups, all of these groups had significantly higher rates of angina 1 year after their MI as compared with patients who were angina-free both before and after their MI (9.9%) (Table 2). In addition, all frequencies of post-MI angina (daily, weekly, or monthly) were associated with increased likelihood of angina at 1 year (Table 3).

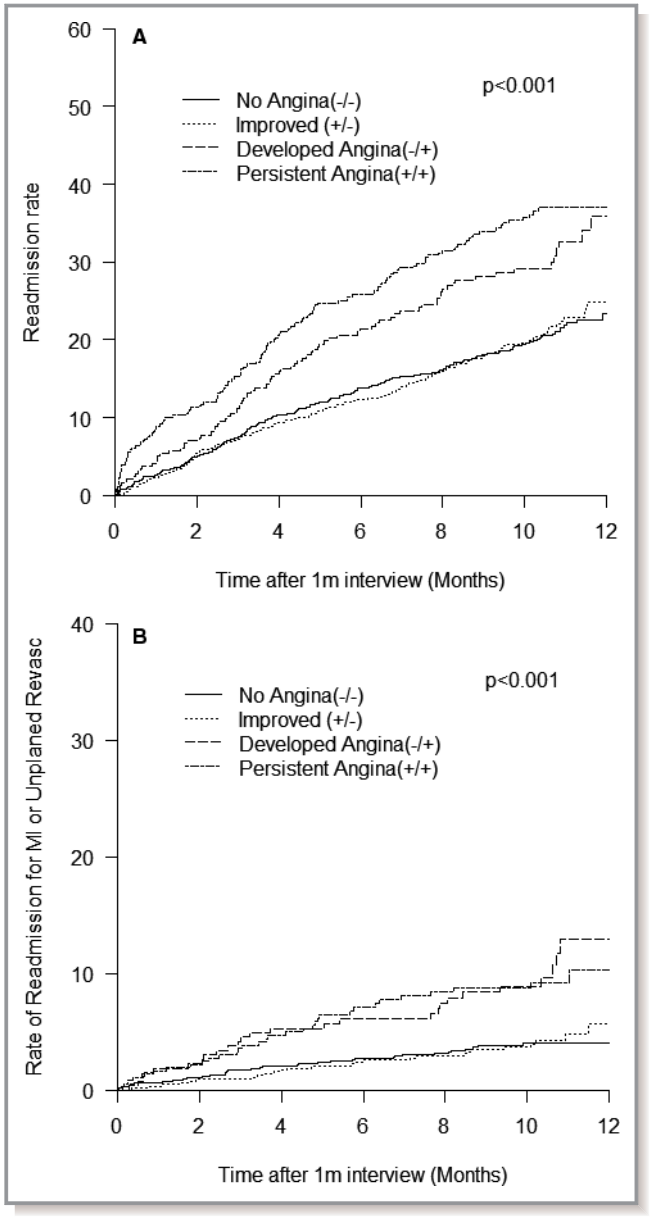

Figure 2. Kaplan–Meier event rates according to change in angina status: (A) all-cause readmission and (B) readmisssion for MI or unplanned revascularization. Events were more frequent for patients with with new or persistent angina at 30 days post-MI. Log-rank test demonstrated statistically significant differences between groups. MI indicates myocardial infarction.

Table 2. Risk of Readmission and Angina at 1 Year According to Change in Angina Status

Change in Angina	All-Cause Readmission at 1 Year		Readmission for MI or Unplanned Revascularization at 1 Year		Angina at 1 Year	
	Kaplan–Meier Estimated Rate	Adjusted HR (95% CI)	Kaplan–Meier Estimated Rate	Adjusted HR (95% CI)	Kaplan–Meier Estimated Rate	Adjusted RR (95% CI)
Angina-free (−/−)	23.3%	Reference	4.0%	Reference	9.9%	Reference
Resolved angina (+/−)	24.8%	0.91 (0.72–1.14)	5.7%	0.89 (0.52–1.53)	18.2%	1.61 (1.32–1.97)
Persistent angina (+/+)	37.1%	1.35 (1.06–1.71)	10.3%	1.67 (0.98–2.86)	49.6%	3.55 (3.05–4.13)
New angina (−/+)	35.9%	1.40 (1.08–1.82)	12.9%	2.18 (1.28–3.72)*	38.6%	3.38 (2.59–4.42)

HR indicates hazard ratio; MI, myocardial infarction; RR, risk ratio.

Discussion

An important treatment goal for patients with acute MI is the prevention of downstream angina symptoms, which not only adversely affect patients' quality of life, but may also lead to greater health care resource use. In this multicenter registry, angina was common both before and after MI, and patients with angina 30 days after their MI, whether persistent or newly developed, were significantly more likely to be hospitalized when compared with those who remained angina-free. Angina at 1 year after MI was common and was significantly more likely among those patients reporting angina 30 days after their MI.

In an era of accountable care and other efforts designed to more efficiently use limited health care resources, intense focus has been placed on avoiding readmissions. Thirty-day readmission rate after MI is a publicly reported hospital quality measure and a focus of the Hospital Readmissions Reduction Program of the Affordable Care Act, with strong incentives or penalties provided to optimize care.[8] Readmissions within 30 days are most commonly caused by acute indications, such as heart failure exacerbation, recurrent MI, and electrolyte disorders,[17] but this study highlights the important association of angina symptoms with admissions after 30 days. Patients with angina at 30 days are a high-risk group who may benefit from targeted clinical interventions during routine clinical follow-up to avoid late readmissions. To our knowledge, this is the first study to describe the association of post-MI change in angina status and readmission. Our results are consistent with past studies demonstrating angina is common after MI[7] and associated with lower quality of life[5] and increased downstream resource utilization.[4]

Differences in readmission risk are unlikely to be explained by anatomic factors, given that we found no differences in the rates of residual coronary stenosis at the time of index hospitalization. Our results remained significant after adjustment for functional status and depression, factors that have been previously associated with risk for readmission. Additionally, antiangina medication use, though infrequent for all groups, was highest among those with the highest readmission rates. Differences in hospitalization rates may have been further exaggerated if treatment patterns were similar for all groups, and future efforts to explore the benefits of more-intense antianginal treatment after MI are warranted. Clinicians should prioritize efforts to reduce angina using medications or cardiac rehabilitation. We identify ample opportunity for improvement, given that use of these therapies was low for all patients in our study. The potential impact of improved angina control is highlighted by the step-wise association of angina frequency with readmission rate.

The rate of readmission for MI and unplanned revascularization was also significantly higher after multivariable adjustment among patients with newly developed angina. Of note, our study did not distinguish between stable and unstable angina symptoms after MI. For some patients, post-

Table 3. Risk of Readmission and Angina at 1 Year According to Frequency of Post-MI Angina

Angina Status at 30 Days Post-MI	All-Cause Readmission at 1 Year	Readmission for MI or Unplanned Revascularization at 1 Year	Angina at 1 Year
	Adjusted HR (95% CI)	Adjusted HR (95% CI)	Adjusted RR (95% CI)
No angina (n=2066, 70.9%)	Reference	Reference	Reference
Monthly (n=568, 19.5%)	1.30 (1.06–1.60)	1.65 (1.04–2.60)	2.15 (1.66–2.78)
Weekly (n=234, 8.0%)	1.63 (1.25–2.12)	2.54 (1.48–4.33)	2.74 (2.23–3.35)
Daily (n=47, 1.6%)	2.15 (1.35–3.42)	3.56 (1.40–9.05)	1.83 (1.29–2.58)

HR indicates hazard ratio; MI, myocardial infarction; RR, risk ratio.

MI angina may represent unstable or progressive coronary disease, leading to recurrent MI or need for revascularization to improve quality of life. For others, angina at 30 days may represent chronic stable angina that persists for many patients to at least 1 year. Clinical follow-up should target secondary prevention of ischemic events in addition to angina reduction.

This study has several potential limitations. Incomplete angina data at 30 days limited our population to two thirds of the total TRIUMPH population. This loss to follow-up could lead to incorrect assessment of the relationship between change in angina and clinical endpoints. Excluded patients were more likely to be younger, nonwhite, and uninsured, all demographic factors that were associated with angina in this study. Therefore, overall rates of angina may have been higher if these patients were included. Inverse probability weighting of all multivariable models to correct for this potential bias did not alter the results. Severity of residual coronary disease was determined by chart review of the coronary angiogram and not an angiographic core laboratory. As such, we cannot definitively exclude the possibility that higher anatomic burden of disease led to both increased angina and rehospitalization rates. Use of the SAQ for assessment of pre-MI angina has not been previously validated and may be subject to some recall bias, though this instrument has performed well compared to angina diaries and other measures of health status in multiple other patient populations. Finally, this is an observational study and our findings may be subject to residual confounding, despite extensive adjustment for clinical and psychosocial variables.

Conclusions

Patients with early post-MI angina are at increased risk for readmission in the first year post-MI, and angina symptoms remain prevalent 1 year post-MI. These results highlight the need for increased attention to routine post-MI angina surveillance and symptom management. Future research to examine novel strategies to reduce post-MI angina should be undertaken in an effort to reduce readmission rates and improve long-term angina control in this high-risk population.

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Disclosures

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SUPPLEMENTAL MATERIAL

Table S1. Baseline and treatment characteristics of patients excluded due to absence of angina data at 30 days vs. included with complete angina data

Variable	**30-day angina data missing N=1385**	**30-day angina data present N=2915**	**p-value**
Age	57.7 ± 12.9	59.6 ± 12.0	<0.001
Male	936 (67.6%)	1938 (66.5%)	0.475
White race	792 (57.4%)	2098 (72.2%)	<0.001
BMI	29.4 ± 6.5	29.7 ± 6.3	0.251
High school education or greater	1026 (74.6%)	2364 (81.5%)	<0.001
Uninsured/self pay	376 (27.5%)	574 (20.1%)	<0.001
Insurance coverage for medications	911 (67.1%)	2147 (75.0%)	<0.001
Prior MI	314 (22.7%)	585 (20.1%)	0.050
Prior PCI	275 (19.9%)	566 (19.4%)	0.735
Prior CABG	148 (10.7%)	336 (11.5%)	0.415
Diabetes	486 (35.1%)	840 (28.8%)	< 0.001
Heart failure	159 (11.5%)	206 (7.1%)	< 0.001
Prior stroke	77 (5.6%)	135 (4.6%)	0.189
Chronic lung disease	100 (7.2%)	212 (7.3%)	0.951
Hypertension	944 (68.2%)	1917 (65.8%)	0.120
Dyslipidemia	643 (46.4%)	1461 (50.1%)	0.024
Current cigarette smoking (1 month)	564 (41.5%)	1084 (37.6%)	0.015
STEMI	536 (38.7%)	1318 (45.2%)	<0.001
Ejection Fraction	47.5 ± 13.8	49.2 ± 12.7	<0.001
Multi-vessel disease	609 (49.1%)	1345 (49.2%)	<0.001
Angina Frequency at baseline			0.031
-Daily	64 (4.6%)	79 (2.7%)	
-Weekly	186 (13.4%)	388 (13.3%)	

-Monthly	391 (28.2%)	826 (28.3%)	
-None	744 (53.7%)	1622 (55.6%)	
SF 12 Mental component score	48.9 ± 12.1	50.1 ± 11.2	0.001
SF 12 Physical component score	41.0 ± 12.8	42.9 ± 12.2	<0.001
PHQ-9 Depression score	5.3 ± 5.4	5.1 ± 5.3	0.386
Fibrinolytic therapy	62 (4.5%)	183 (6.3%)	0.017
In-hospital PCI	827 (59.7%)	1977 (67.8%)	<0.001
In-hospital CABG	111 (8.0%)	286 (9.8%)	0.057
Residual stenosis ≥50% in at least 1 vessel	794 (57.3%)	1799 (61.7%)	0.006

Abbreviations: BMI, body mass index; MI, myocardial infarction; PCI, percutaneous coronary intervention; CABG, coronary artery bypass graft; STEMI, ST-segment elevation myocardial infarction